

REMARKS*Rejections Relying on 35 U.S.C. § 102*

Claims 1-2, 10-14, 16-18, 23-24, 41-42, 44-46, 48, 54 were rejected under 35 U.S.C. § 102 (a) as being anticipated by Wang (U.S. Patent 6,091,101). Applicant respectfully traverses.

Claims 1-2 and 10-12

Claim 1 recites, in part, "wherein the source region is coupled to a second semiconductor region underlying the first semiconductor region." The Office Action identifies the n-well 103 of Wang as corresponding to Applicant's second semiconductor region and the source 117 of Wang as corresponding to Applicant's source region.

Applicant contends that the n-well 103 and source 117 of Wang cannot be coupled as required by claim 1 as Wang teaches that its device is capable of holding its n-well 103 and its source 117 at distinctly different potentials. *See, e.g.*, Wang, column 3, line 64 through column 4, line 1 ("For programming charge into the floating gate 2 . . . a voltage of 5 volts is applied to the source 117, . . . and the deep n-well 103 is held at ground."); column 4, lines 9-12 ("In order to erase all of floating gates, . . . a voltage of 5 volts is applied to . . . the deep n-well 103, and the drain 119 and source 117 are floating."). Furthermore, if the source 117 of Wang is coupled to its n-well 103, its drain 119 must also be coupled to its n-well 103. This is inherently impossible as it could no longer function as a memory cell if its source and drain are electrically coupled. Accordingly, Wang does not teach or suggest each and every element of claim 1, but rather expressly teaches away from the elements as recited in claim 1. As claims 2 and 10-12 depend from and further define patentably distinct claim 1, these claims are also believed to be allowable.

Claim 13

Claim 13 recites, in part, "wherein the source region is coupled to the second semiconductor region." As noted above with reference to claim 1, Wang expressly teaches away from this claim limitation. Accordingly, Applicant contends that claim 13 is patentably distinct from the cited reference.

Claim 14

Claim 14 recites, in part, "a source-line contact extending from the source region to a lower well region." The Office Action has identified a portion of Wang's n-well 103 as corresponding to Applicant's source-line contact. This identification has been made by the Office by an alteration of Figure 7 in the copy of the Wang reference provided to Applicant. The alteration includes shading a left vertical portion of the n-well 103 between the upper surface of the p-substrate 101 and the lower surface of the p-well 105. Applicant has carefully reviewed the Wang reference and is unable to locate any support for this characterization of the n-well 103. Applicant further contends that Wang expressly teaches away from the characterization advanced by the Office Action as it would make the memory cell non-functional.

As noted with reference to claim 1, no portion of Wang's n-well 103 can be characterized as corresponding to a source-line contact as that term is used in Applicant's Specification and claims as the source 117 could not, as one example, be allowed to float while the n-well 103 is held at 5 volts. If the vertical portion of the n-well 103 were a contact to the source 117, they would be substantially at the same potential. Furthermore, if the n-well 103 is a source-line contact as characterized by the Examiner, it must also be a drain contact, effectively shorting the source 117 to the drain 119. As this is inherently non-functional as a memory device, Applicant contends that Wang expressly teaches away from the characterization advanced in the Office Action. Because Wang does not teach or suggest each and every limitation of Applicant's claim 14, claim 14 is patentably distinct from the cited reference.

Claims 16-18 and 23-24

Claim 16 recites, in part, “a source region in the upper well region and having the second conductivity type, wherein the source region is coupled to a lower well region underlying the upper well region and having the second conductivity type.” As noted above with reference to claim 1, Wang expressly teaches away from this claim limitation. Accordingly, Applicant contends that claim 16 is patentably distinct from the cited reference. As claims 17-18 and 23-24 depend from and further define patentably distinct claim 16, these claims are also believed to be allowable.

Claims 41-42

Claim 41 recites, in part, “a second source/drain region having the second conductivity type in the well region having the first conductivity type, wherein the second source/drain region is coupled to the well region having the second conductivity type.” As noted above with reference to claim 1, Wang expressly teaches away from this claim limitation. Accordingly, Applicant contends that claim 41 is patentably distinct from the cited reference. As claim 42 depends from and further defines patentably distinct claim 41, this claim is also believed to be allowable.

Claim 44

Claim 44 recites, in part, “a source region in the p-well and having the n+-type conductivity, wherein the source region is coupled to the n-well.” As noted above with reference to claim 1, Wang expressly teaches away from this claim limitation.

Claims 46 and 48

Claim 46 recites, in part, “a source-line contact extending from the n+-type source region to the n-well.” As noted above with reference to claim 14, Wang expressly teaches away from this claim limitation. As claim 48 depends from and further defines patentably distinct claim 46, this claim is also believed to be allowable.

Claim 54

Claim 54 recites, in part, "a source region in the upper well region and having the n+-type conductivity, wherein the source region is coupled to a lower well region underlying the upper well region." As noted above with reference to claim 1, Wang expressly teaches away from this claim limitation.

In view of the foregoing, Applicant contends that claims 1-2, 10-14, 16-18, 23-24, 41-42, 44-46, 48, 54 are patentably distinct from the cited reference. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejections, and allowance of claims 1-2, 10-14, 16-18, 23-24, 41-42, 44-46, 48, 54.

Rejections Under 35 U.S.C. § 103

Claims 25, 28-29, 31-35, 38-39, 58, 61-62 and 64-65 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Wang (U.S. Patent 6,091,101) in view of Wang et al. (U.S. Patent 5,553,018).

As noted in the response to the rejections under 35 U.S.C. § 102, the Wang reference does not teach that its source 117 is coupled to its n-well 103 as Wang describes the operation of its memory cell to require differing voltages applied to its source 117 and n-well 103. Similarly, if Wang's source 117 were coupled to its n-well 103, Wang's drain 119 must also be coupled to its n-well 103, making the memory cell non-functional. Wang et al. fails to overcome this deficiency of the Wang reference. Accordingly, Applicant contends that the cited references, either alone or in combination, fail to teach each and every limitation of Applicant's claims, and in fact teach away from the characterization advanced by the Office Action. Applicant thus respectfully requests reconsideration and withdrawal of the rejections under 35 U.S.C. § 103(a), and allowance of claims 25, 28-29, 31-35, 38-39, 58, 61-62 and 64-65.

Generic Claims

Claims 3-9, 15, 19-22, 26, 27, 30, 36, 37, 40, 47, 49-53, 55-57, 59, 60 and 63 were withdrawn as directed to non-elected species. Applicant asserted in its response to

RESPONSE TO NON-FINAL OFFICE ACTION

Serial No. 09/741,525

PAGE 24

Attorney Docket No. 400.063US01

Title: FLASH CELL WITH TRENCH SOURCE-LINE CONNECTION

the Restriction Requirement that the elected claims were generic to the non-elected species. As Applicant believes that generic claims are in condition for allowance, Applicant contends that it is entitled to consideration of claims to the other species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. Applicant thus requests that claims 3-9, 15, 19-22, 26, 27, 30, 36, 37, 40, 47, 49-53, 55-57, 59, 60 and 63 be reinstated and allowed.

CONCLUSION

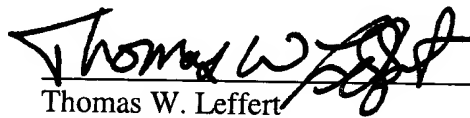
Claims 1-2, 10-14, 16-18, 23-24, 41-42, 44-46, 48, 54 are currently pending. Applicant has requested reinstatement of unelected claims 3-9, 15, 19-22, 26, 27, 30, 36, 37, 40, 47, 49-53, 55-57, 59, 60 and 63.

In view of the above remarks, Applicant respectfully submits that all pending and withdrawn claims are in condition for allowance and requests reconsideration of the application and allowance of the claims. No new matter has been added and no additional fee is required by this amendment and response.

The Examiner is invited to contact Applicant's representative at direct dial (612) 312-2204 if there are any questions regarding this response or if prosecution of this application may be assisted thereby.

Respectfully submitted,

Date: 18 SEP 03


Thomas W. Leffert
Reg. No. 40,697

Attorneys for Applicant
Leffert Jay & Polglaze, P.A.
P.O. Box 581009
Minneapolis, MN 55458-1009
telephone: (612) 312-2200
facsimile: (612) 312-2250